Fact Sheet

U.S. Environmental Protection Agency
Region 10

The United States Environmental Protection Agency (EPA)
Plans to Issue a
National Pollutant Discharge Elimination System (NPDES) Permit to:

Applicant: City of Preston
Wastewater Treatment Plant
70 West Oneida
Preston, Idaho

Permit No.: ID0020214

Public Comment Period
Starts: December 15, 2004
Ends: January 14, 2005

Technical Contact
Name: Lindsay Guzzo
Phone: (206)553-0268
1-800-424-4372 ext.0268 (within Alaska, Idaho, Oregon, and Washington)
Email: guzzo.lindsay@epa.gov

EPA's Tentative Determination
EPA proposes to issue an NPDES permit to the City of Preston Wastewater Treatment Plant. The draft permit places conditions on the discharge of pollutants from the Sewage Treatment Plant to Worm Creek. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:

•information on public comment, public hearing, and appeal procedures;
•a description of the facility and proposed discharge;
•a listing of proposed effluent limitations, and other conditions;
•a map and description of the discharge location; and
•detailed technical material supporting the conditions in the permit.

Public Comment and Public Hearings

Persons wishing to comment on the tentative determinations contained in the draft permit must do so, in writing, by the end date of this public comment period. All comments should include the name, address, and telephone number of the commenter, reference the facility name and NPDES permit number, and include a concise statement of the exact basis of any comment and the relevant facts upon which it is based.

Persons wishing to request that a public hearing be held may do so, in writing, by the end date of this public comment period. A request for a public hearing must state the nature of the issues to be raised, reference the facility name and NPDES permit number, and include the requester's name, address, and telephone number.

All written comments and requests should be submitted to the attention of the Director, Office of Water at the following address:

U.S. EPA, Region 10
1200 Sixth Avenue, M/S OWW-130
Seattle, Washington 98101

Comments may also be submitted electronically to the technical contact listed above.

After the Public Notice expires, and all comments have been considered, EPA's Director for the Office of Water in Region 10 will make a final decision regarding permit issuance. If no significant comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless the permit is appealed to the Environmental Appeals Board within 30 days.

Availability of Documents

The following documents are available at the EPA Region 10 Office, 1200 Sixth Ave, Seattle, Washington, between 8:30 a.m. and 4:00 p.m., Monday through Friday:

•permit application and any supporting data submitted by the permittee
•draft permit
•fact sheet
•documents referenced in fact sheet
•other documents (e.g., meeting reports, correspondence, trip reports, telephone memos, calculations, etc.)
•State of Idaho preliminary comments

Copies of the draft permit and fact sheet are also available at:

EPA Region 10 website: **www.epa.gov/r10earth**

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(206) 378-5746

Preston City Office
70 West Oneida Street
Preston, Idaho 83263
(206) 852-1817

State Certification

EPA is requesting that the Idaho Department of Environmental Quality certify this NPDES permit for the **City of Preston**, under section 401 of the Clean Water Act. The State provided preliminary comments on the draft permit, and those comments have been incorporated into this draft permit.

Persons wishing to comment on the State's intent to certify this permit should submit written comments by the end date of this public comment period to the Administrator of IDEQ, with a copy to EPA, at the following address:

Administrator, State of Idaho
Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way, #300
Pocatello, Idaho 83201

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ACRONYMS

BMPs	Best management practices
BOD	Biochemical oxygen demand
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
CFR	Code of Federal Regulations
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Division of Environmental Quality
lb	pounds
mg/L	milligrams per liter
mL	milliliter
MSWLF	Municipal solid waste landfill
N	Nitrogen
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NR	Not required
OW	Office of Water
P	Phosphorus
POTW	Publicly owned treatment works
QAPP	Quality assurance project plan
sp.	Species
TRC	Total residual chlorine
TSD	Technical Support document (EPA, 1991)
TSS	Total suspended solids
TWTDS	Treatment works treating domestic sewage
USFWS	U.S. Fish and Wildlife Service
WET	Whole effluent toxicity
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

I. BACKGROUND

A. Applicant

City of Preston
Wastewater Treatment Plant (WWTP)

Facility Location:
1004 East 8 South
Preston, Idaho 83263

Mailing Address:
70 West Oneida
Preston, Idaho 83263

Facility Contact: Tom Edwards, Plant Operator
(208) 852-2930

B. Activity

The City of Preston is located in the southeastern corner of Idaho in the county of Franklin. The City owns and operates a municipal wastewater treatment plant that provides secondary treatment and disinfection of wastewater prior to discharge in Worm Creek, a tributary of the Cub River.

The plant receives domestic wastewater from residential and commercial sources; there are no significant industrial dischargers. The facility's design flow is 1.2 million gallons per day (mgd) with an instantaneous peak flow of 1.8 mgd. Details about the treatment process are discussed in Appendix A and a map showing the location of the facility is located in Appendix B.

C. Facility History

The existing wastewater treatment plant is the result of three major construction projects. The first primary treatment facility was constructed on-site in 1942, consisting of settling and anaerobic sludge digestion. Improvements to the primary system and secondary processes were added in 1966. The additions included a trickling filter, secondary clarifier, chlorine disinfection and head works (screening, comminution and mechanical grit removal). By the late 1970s, the treatment plant had begun to experience problems, both mechanical and loading in nature. This led to the most recent construction project in 1989 that

resulted in the construction of a new facility using an oxidation ditch and UV disinfection.

D. Plant Performance

A review of the Discharge Monitoring Reports (DMRs) and Compliance Sampling Inspection Reports for the past five years shows that the existing plant had a period of time (September 2002 – August 2003) where they had problems complying with their ammonia limit. The problem has been fixed and the facility has not been out of compliance since. A summary of the plant performance for the past five years is provided in Table I-1. The violations indicated in Table I-1 occurred in 2002 and 2003.

TABLE I-1. SUMMARY OF PLANT PERFORMANCE (1999 – 2004)

Parameter	Average Plant Performance	# Reported Violations
Flow	.73 mgd	N/A
Effluent BOD_5	21.90 mg/L	0
	15.44 lbs/day	0
Effluent TSS	19.56 mg/L	0
	103.52 lbs/day	0
% Removal, BOD_5	90.42 %	0
% Removal, TSS	91.63 %	0
E. Coli	127 colonies/100 mL	0
Dissolved Oxygen	6.07 ppm	0
Ammonia	4.87 mg/L	12
	27.13 lb/day	12
PH	6.95	0

II. RECEIVING WATER

Worm Creek, Idaho

The City of Preston WWTP effluent discharges to Worm Creek through outfall 001, located at latitude 42°04'27" and longitude 111°50'59". Worm Creek is located in the

Bear River Basin. The creek flows southward approximately 15 miles into the Cub River in Cache County, Utah. During the irrigation season, much of Worm Creek is diverted for agricultural purposes.

The State of Idaho water quality standard's (IDAPA, 2003) present designated uses for Worm Creek are: agricultural water supply, cold water biota and secondary contact recreation. Salmonid spawning and primary contract recreation are designated as future uses.

III. EFFLUENT LIMITATIONS

Sections 101, 301(b), 304, 308, 401, 402 and 405 of the CWA provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations in determining which conditions to include in the permit.

In general, EPA first determines which technology-based limits are required to be incorporated into the permit (40 CFR Part 122.44[a]), as well as best management practices or other requirements. Technology-based limits for municipal facilities are derived from secondary treatment standards (40 CFR Part 133.102) and based on end of pipe technology. However, the CWA also requires NPDES permitted discharges to demonstrate compliance with state water quality standards.

Water quality-based effluent limits are derived from state water quality standards to protect the water quality of state waters. Therefore, the effluent limitations are developed from the technology available to treat the pollutants (technology-based limits) and limits that are protective of the designated uses of the receiving water (water quality-based limits). The proposed permit will reflect whichever limits (technology-based or water quality-based) are more stringent.

A. Summary of Draft Permit Limitations

For wastewater treatment plants, technology-based limits cover three parameters: five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH. In their permit application, the City of Preston identified the following additional pollutants as being present in their discharge: fecal coliform bacteria, E. Coli, temperature, dissolved oxygen (DO), fluoride, arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Fluoride, arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver were indicated as present because of a previous analysis that was performed on the treatment plant effluent. The analysis showed that these pollutants are present in levels well below the water quality criteria. While fecal coliform has been used in past permits, the Idaho water quality standards now require E. coli instead of fecal

coliform for protection of human health. Therefore, the draft permit is proposing effluent limitations for BOD, DO, E. Coli, pH, ammonia, and TSS.

Table III-1 presents the City of Preston's proposed effluent limitations for their wastewater treatment plant. For comparison purposes, the table also shows the effluent limitations of the current permit.

TABLE III-1. PROPOSED EFFLUENT LIMITATIONS

Parameter	Units	Monthly Average		Weekly Average		Maximum Daily		Minimum Daily	
		Current (1999)	Draft (2004)	Current (1999)	Draft (2004)	Current (1999)	Draft (2004)	Current (1999)	Draft (2004)
Ammonia	mg/L	2.10	2.0	---	---	3.89	4.1	---	---
	lb/day	21	20.5	---	---	39	41.1	---	---
BOD_5[1]	mg/L	30	30	45	45	---	---	---	---
	lb/day	300	300	450	450	---	---	---	---
DO (minimum)	mg/L	---	---	---	---	---	---	---	6.0
E. Coli	colonies / 100 mL	---	126[2]	---		---	576	---	
pH	s.u.	---	---	---	---	9.0	9.0	6.5	6.5
TSS[1]	mg/L	30	30	45	45	---	---	---	---
	lb/day	300	300	450	450	---	---	---	---

1 The average monthly percent removal shall be greater than 85% and calculated from the arithmetic mean of the influent values and arithmetic mean of the effluent values for that month.

2 Based on a geometric mean of all samples taken in that month.

Mixing Zone

Per discussions with the State of Idaho concerning low flows in Worm Creek at Preston, Idaho, it was determined that no mixing zone was going to be used to calculate reasonable potential or to establish effluent limitation for any effluent parameter in the draft permit. The low flow causes the creek to reduce the assimilative capacity to accept loadings of waste greater than criteria.

C. Evaluation of Effluent Limitations

1. Biochemical Oxygen Demand, five-day (BOD_5)

The City of Preston WWTP is a secondary treatment facility that is subject to the federal technology-based requirements for BOD_5. These requirements state that the 30-day average shall not exceed 30 mg/L, the 7-day average shall not exceed 45 mg/L, and the 30-day average percent removal shall not be less than 85 percent. Furthermore, the Idaho water quality standards require that sewage wastewater discharges limit BOD to the equivalent of 85 percent removal but not more than a 30-day average concentration of 30 mg/L.

Additionally, the Utah water quality standards require that BOD in the receiving water is less than 5 mg/L. The Utah boarder is located approximately six miles downstream of the point of discharge and there are several tributaries that contribute to the flow between the point of discharge and the Utah boarder. Therefore, it has been determined, using best professional judgement, that the effluent does not have the reasonable potential to violate this standard. Therefore, the technology-based limits will be the proposed limits in the draft permit.

The draft permit proposes to retain the existing BOD_5 limits of 30 mg/L (300 lb/day) average monthly limit, 45 mg/L (450 lb/day) average weekly limit, and an average monthly limit of >85% removal.

2. Deleterious Materials.

The Idaho water quality standards require surface waters of the state to be free from deleterious materials in concentrations that impair designated beneficial uses.

The draft permit meets this requirement by meeting Idaho water quality standards.

3. Dissolved Oxygen (DO).

The Idaho water quality standards require surface waters of the state to be free from oxygen-demanding materials in concentrations that would result in an aerobic water condition. Additionally, the standards for Cold Water Biota and Salmonid Spawning require that the DO concentration exceed 6.0 mg/L at all time.

Utah water quality standards for aquatic wildlife require 5.5 mg/L minimum monthly average, 6 mg/L minimum weekly average, and 5 mg/l

minimum daily average for dissolved oxygen levels, when early life stages are present. Since the more limiting case applies, Idaho water quality standards for DO will be applied to this facility.

The draft permit is proposing to retain the existing limits of DO >6.0 mg/L in the permittee's effluent at the point of discharge. Past monitoring show that the facility can meet this limit.

4. Bacteria.

In past permits, fecal coliform was used to measure the bacteria present in a facility's effluent. However, the standards have been changed and E. Coli is now used to measure the bacteria present. E.Coli is a non-pathogenic indicator species whose presence suggests the likelihood that pathogenic bacteria are present. Idaho water quality standards for secondary contact recreation require that E.Coli bacteria shall not exceed 576 colonies/100 mL at any time, and a geometric mean of 126/100 mL based on a minimum of five samples taken every three to five days over a thirty day period.

The Utah water quality standards for secondary contact recreation limit fecal coliform, but do not include requirements for E. Coli bacteria. Because E. Coli and fecal coliform are both used to indicate pathogenic bacteria and protect for human health, the Idaho standards are considered protective of the quality of water entering Utah. The Idaho E. Coli standards will be considered the limiting requirements and will be applied to this facility.

The draft permit is proposing to eliminate the existing fecal coliform limits and add the following E. Coli limits: 576 colonies/100 mL maximum daily limit and 126 colonies/100 mL average monthly limit based on a geometric mean of all samples taken during the month. Based on DMR's collected between 1999-2004, the facility will not be able to meet this limit constantly and may need a compliance schedule.

5. Floating, Suspended or Submerged Matter.

The Idaho water quality standards require surface waters of the state to be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses. This includes any petroleum products that cause a sheen or coating on the water surface.

The draft permit proposes retaining the existing requirement that the facility meet a narrative standard for floating, suspended, or submerged

matter. If a sheen occurs, the size and extent of the sheen or coating should be documented in the facility's daily log book.

6. Toxic Substances

a. Narrative Criteria

The Idaho water quality standards require surface waters of the state to be free from toxic substances in concentrations that impair designated beneficial uses. The draft permit requires the permittee to meet the narrative criteria of "no toxics in toxic amounts" be released to the environment and biomonitoring as required by the federal regulations (see V. C. "Whole Effluent Toxicity" for biomonitoring requirements).

b. Ammonia

The toxic ammonia criterion for aquatic life has changed since the previous permit in both Idaho and Utah. Using the 95th percentile temperature (17.59°C) and pH (7.835) the acute criterion is 7.62 mg/l and the chronic criterion is 2.50mg/L. The discharge shall not exceed 2.1 mg/L for an average monthly limit and 4.1 for a maximum daily limit. Since this water body is limited for nutrients, the criterion will be applied at the end-of-pipe (See Appendix C for calculations). The data from the DMR's submitted (1999-2004) show that the facility can generally comply with end of pipe limits, but will need to operate the plant very efficiently.

The draft permit proposes the following Ammonia limits: 2.1 mg/L (20.5 lb/day) average monthly limit, 4.1 mg/L (41.1 lb/day) maximum daily limit.

7. Nutrients

Nutrients consist of phosphorus, nitrogen and carbon compounds. The nutrients of concern for this facility are ammonia and phosphorus. The State of Idaho added Worm Creek to the list of impaired water bodies for nutrients and is working on a TMDL to be issued in the near future.

a. Narrative Criteria

Idaho water quality standards require that surface waters of the United States within Idaho shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.

b. Ammonia

Idaho water quality standards do not list an ammonia standard. The ammonia toxicity limit is more stringent than national guidelines, therefore, will be protective of Idaho's water quality. The ammonia limit listed in Toxic Substances (2.1 mg/L (20.5 lb/day) average monthly limit, 4.1 mg/L (41.1 lb/day) maximum daily limit) are the proposed limits.

c. Total Phosphorus

Phosphorus as phosphate is one of the major nutrients required for plant nutrition and is essential for life. In excess of critical concentration, phosphates stimulate plant growths. This excess growth can lead to noxious plant growth, especially in lakes and reservoirs, and eutrophication or aging of waters.

Although there is an aquatic life criterion in the state of Utah for total phosphorus no limit will be applied at this time. A TMDL for phosphorus, in the Bear River Basin, is being worked on by the IDEQ. After finalization and approval, by EPA, of the TMDL, EPA will implement the given WLA to this facility in future permits.

8. pH

The technology-based limitation for POTWs, based on federal regulations (40 CFR Part 133.102) is 6.0 to 9.0 standard units. The Idaho water quality standards for aquatic life gives an allowable pH range of 6.5 to 9.5 standard units. Additionally, the Utah water quality standards give an allowable pH range of 6.5 to 9.0 standard units for designated uses. Since there is no mixing zone, the more stringent water quality limits apply.

The draft permit proposes to retain the existing a pH limit of 6.5 to 9.0 standard units. Based on past DMRs the facility should have no problems meeting this pH limit.

9. Total Residual Chlorine (TRC)

The WWTP uses chlorine as a back-up for disinfection in the event of a power outage. The facility has not used this system since the construction of the oxidation ditch in 1989. Since this is a rare event with a short occurrence time, no limit will be imposed on the facility. However, monitoring of the effluent during the use of the chlorination system will be required.

No limit for TRC is proposed in the draft permit.

10. Total Suspended Solids (TSS)

The City of Preston WWTP is a secondary treatment facility that is subject to the federal technology-based requirements for TSS. These requirements state that the 30-day average shall not exceed 30 mg/L, the 7-day average shall not exceed 45 mg/L, and the 30-day average percent removal shall not be less than 85 percent. Furthermore, the Idaho water quality standards require that sewage wastewater discharges limit TSS to the equivalent of 85 percent removal but not more than a 30-day average concentration of 30 mg/L.

The draft permit proposes to retain the following TSS limits: 30 mg/L (300 lb/day) average monthly limit, 45 mg/L (450 lb/day) average weekly limit, and >85% removal.

11. Turbidity

The Idaho water quality standards for cold water biota require that turbidity shall not exceed background turbidity by more than fifty NTU instantaneously or more than twenty-five NTU for more than ten consecutive days. Additionally, Utah water quality standards for secondary contact recreation and warm water species requires that turbidity shall not exceed background turbidity by more than ten NTU. Since turbidity is directly related to total suspended solids, the TSS limit shall prove protective of this requirement.

No limit for turbidity is proposed in the draft permit.

D. Antidegradation

In proposing to reissue this permit, EPA has considered Idaho's antidegradation policy. This provision states that "the existing instream water uses and the level of water quality necessary to protect the existing uses will be maintained and protected." This policy is designed to protect existing water quality when the existing water quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. The draft permit will result in a decreased amount of the authorized pollutant loadings, for most contaminants, to Worm Creek. The one exception to the reduced pollutant concentration and loading is for the allowable maximum daily concentration and loading for ammonia. The limit has increased slightly due to a change in criteria in the Idaho and Utah water quality standards.

Under Section 303(d)(4) of the Clean Water Act, where water quality standards are attained, permit limits may be revised if such a revision is consistent with the State's antidegradation policy. Worm Creek in the vicinity of the City's WWTP discharge is in attainment for all parameters of concern in that it meets the Idaho water quality standards. In addition, because Worm Creek is a Tier 1 water, increases in pollutant loading are allowed provided that State water quality standards continue to be met. Even with the increased water quality-based limits, Idaho's water quality standard for ammonia is met. Therefore, the draft permit will not result in degradation of water quality and is consistent with Idaho's antidegradation policy.

IV. MONITORING REQUIREMENTS

Section 308 of the CWA and federal regulation 40 CFR Part 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Additionally, monitoring may be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The permittee is responsible for conducting the monitoring and for reporting results with Discharge Monitoring Reports (DMRs) to EPA.

A. Effluent Monitoring

Table IV-1 presents the effluent monitoring requirements for the draft permit. For comparison purposes, the table also includes the monitoring requirements of the current permit. Based on the data collected between 1999 and 2004, and the Interim Guidance For Performance-Based Reduction of NPDES Permit Monitoring Frequencies, the monitoring frequency for BOD_5, TSS, and pH have been reduced.

TABLE IV-1: EFFLUENT MONITORING FREQUENCY REQUIREMENTS		
Parameter	**Current Permit (1999)**	**Draft Permit (2004)**
Ammonia as N	1/week	1/week
BOD_5	2/week	1/week
DO	2/week	2/week
E. Coli[1]	1/week	5/month
Flow	continuous	continuous
PH	5/week	3/week
Total Phosphorus as P	1/week	1/week
TSS	2/week	1/week
Total Residual Chlorine (TRC)[2]	5/week	5/week

1 Monthly limits are based on a minimum of five samples taken every 3-5 days within a calendar month.
2 When used.

B. Ambient Monitoring

The purpose of ambient monitoring is to determine water quality conditions as part of the effort to evaluate the reasonable potential for the discharge to cause an instream excursion above water quality criteria. In addition, ammonia, BOD_5, TSS, DO, flow, and E. Coli data are used to ensure limits are protecting the water quality and to provide information for the next permit. Total phosphorus is used to provide information for TMDL development. The draft permit requires the permittee to conduct quarterly ambient (in-stream) monitoring upstream and downstream of outfall 001. The permittee must collect surface water samples as composite samples consisting of three grab samples, one collected from each side of the river and one collected from the middle of the river. Upstream monitoring shall consist of ammonia, BOD_5, DO, flow, pH, E. coli, total phosphorus and temperature. Downstream monitoring shall consist of ammonia, pH, E. coli, and total phosphorus.

V. SPECIAL CONDITIONS

A. Quality Assurance Plan (QAP)

Under 40 CFR Part 122.41(e), the permittee is required to ensure adequate laboratory controls and appropriate quality assurance procedures in order to

properly operate and maintain all facilities which it uses. Therefore, this permit requires the permittee to develop a QAP that will assist in planning for the collection and analysis of samples in support of the permit and assist in explaining data anomalies when they occur. The permittees are required to revise and update the QAP within 60 days of the effective date of the final permit, and notify EPA that they have done so. The QAP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Best Management Practices (BMPs)

Section 402 of the CWA and federal regulation 40 CFR Part 122.44(k) authorize EPA to require best management practices (BMPs) in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility Operation & Maintenance (O&M) plans. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires that the permittee revise and update their O&M plan including the implementation of BMPs within 60 days of permit issuance. EPA has a guidance manual (*Guidance Manual for Developing Best Management Practices* EPA, 1993) that may provide some assistance in the development of BMPs. Specifically, the permittee must consider spill prevention and control, optimization of chemical use, public education aimed at controlling the introduction of household hazardous materials to the sewer system and water conservation. Furthermore, it is considered a good management practice to maintain a log of daily plant operations and observations. Additionally, the BMP operating plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

C. Whole Effluent Toxicity (WET)

The WET approach measures the aggregate effect of all toxicants in the effluent. WET tests are laboratory tests that use small vertebrate and invertebrate species or plants to measure the toxicity of an effluent. The municipal application regulations (40 CFR Part 122.21[j][1]) require POTWs with design influent flows equal to or greater than 1.0 mgd, and POTWs with approved pretreatment programs, to submit results of WET testing with their permit application.

Since the State of Idaho does not have numeric criteria for toxicity, Region 10 uses the chronic criterion of 1.0 TUc as recommended by the TSD (EPA, 1991). When no mixing zone is authorized, then the 1.0 TUc must be met at end-of-pipe,

as is the case for the Preston facility. Since Worm Creek flows year round, it is reasonable to assume that dilution from the receiving water will lower the potential for toxic effects. However, the stream flow of Worm Creek is extremely low during parts of the year, so applying the criteria end-of-pipe is determined to be protective of the receiving water designated uses for the duration of this permit.

The draft permit proposes that WET testing for two species be conducted semi-annually. However, if the tests from the first year indicate no toxicity, then the permittee is only required to repeat the toxicity testing in the fourth year. The results of the WET tests shall be submitted with the DMR and a final report will be due by the end of the month. The results of the WET tests shall be considered during permit re-issuance.

D. Toxicity Reduction Evaluation (TRE) Plan

The draft permit requires that the permittee revise and update their TRE plan within 60 days of permit issuance. A TRE is an evaluation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits (i.e., reducing an effluent's toxicity or chemical concentrations(s) to acceptable levels). These limits are intended to protect beneficial uses of waterbodies, and consider factors such as dilution, environmental fate, and the sensitivity of the resident aquatic community. The TRE may identify a remedial action as simple as improved "housekeeping" procedures or the need to modify the operation of a component of the wastewater treatment system. On the other hand, for complex facilities with numerous and variable wastestreams, a TRE may involve a more extensive investigation to identify toxicant(s) of concern and/or cost-effective treatment or source reduction options. (*Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TRE) EPA, 1989*)

VI. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration Fisheries (NOAA) and the U.S. Fish and Wildlife Service (USFWS) if the agency's actions could beneficially or adversely affect any threatened or endangered species. Therefore, EPA requested a listing of threatened or endangered species in the vicinity of the City of Preston WWTP from NOAA and USFWS on July 27, 2004.

In a letter dated August 19, 2004, the USFWS stated that the proposed project is unlikely to adversely impact any species listed under the Endangered Species Act of 1973, as amended, in its jurisdiction in Worm Creek. NOAA did not respond by the completion date of this fact sheet, nor where any endangered or threatened species listed on NOAA the website in Worm Creek or near Preston, Idaho. Therefore, it is determined that issuance of this permit is not likely to adversely affect any species in the vicinity of the discharge.

B. State Certification

Since this permit authorizes discharge to Idaho State waters, Section 401 of the CWA requires EPA to seek state certification before issuing a final permit. This certification by the state ensures that federally issued permits are in compliance with the laws of the state. EPA is requesting Idaho State officials to review and provide appropriate certification to this NPDES permit pursuant to 40 CFR Part 124.53. Additionally, in accordance with 40 CFR Part 124.10(c)(1), public notice of the draft permit has been provided to the State of Idaho agencies having jurisdiction over fish, shellfish, and wildlife.

C. Permit Expiration

This permit will expire five years from the effective date of the permit.

E. Interstate Waters

Under 40 CFR Part 124.10(c)(1)(iii), EPA must give notice of this permit action to any affected state. Notice has been given to Utah Department of Environmental Quality and other Utah state agencies (as defined in this regulation) potentially impacted by this action.

VII. REFERENCES

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* U.S. Environmental Protection Agency, Office of Water, EPA/505/2-90-001, March 1991.

EPA. 1993. *Guidance Manual for Developing Best Management Practices (BMP).* U.S. Environmental Protection Agency, Office of Water, EPA/833/B-93-004.

EPA. 1996. *U.S. EPA NPDES Permit Writer's Manual.* U.S. Environmental Protection Agency, Office of Water, EPA/833/B-96-003.

IDAPA. 2003. *Water Quality Standards and Wastewater Treatment Requirements.* Idaho Department of Health and Welfare Rules, Title 01, Chapter 02.

UDEQ. 2004. *Standards of Quality for Water of the State.* Utah Department of Environmental Quality, Division of Water Quality, Utah Administrative Code, R317-2.

APPENDIX A

PROCESS DESCRIPTION

HEAD WORKS

- Control box
- Flow measurement

PRIMARY TREATMENT

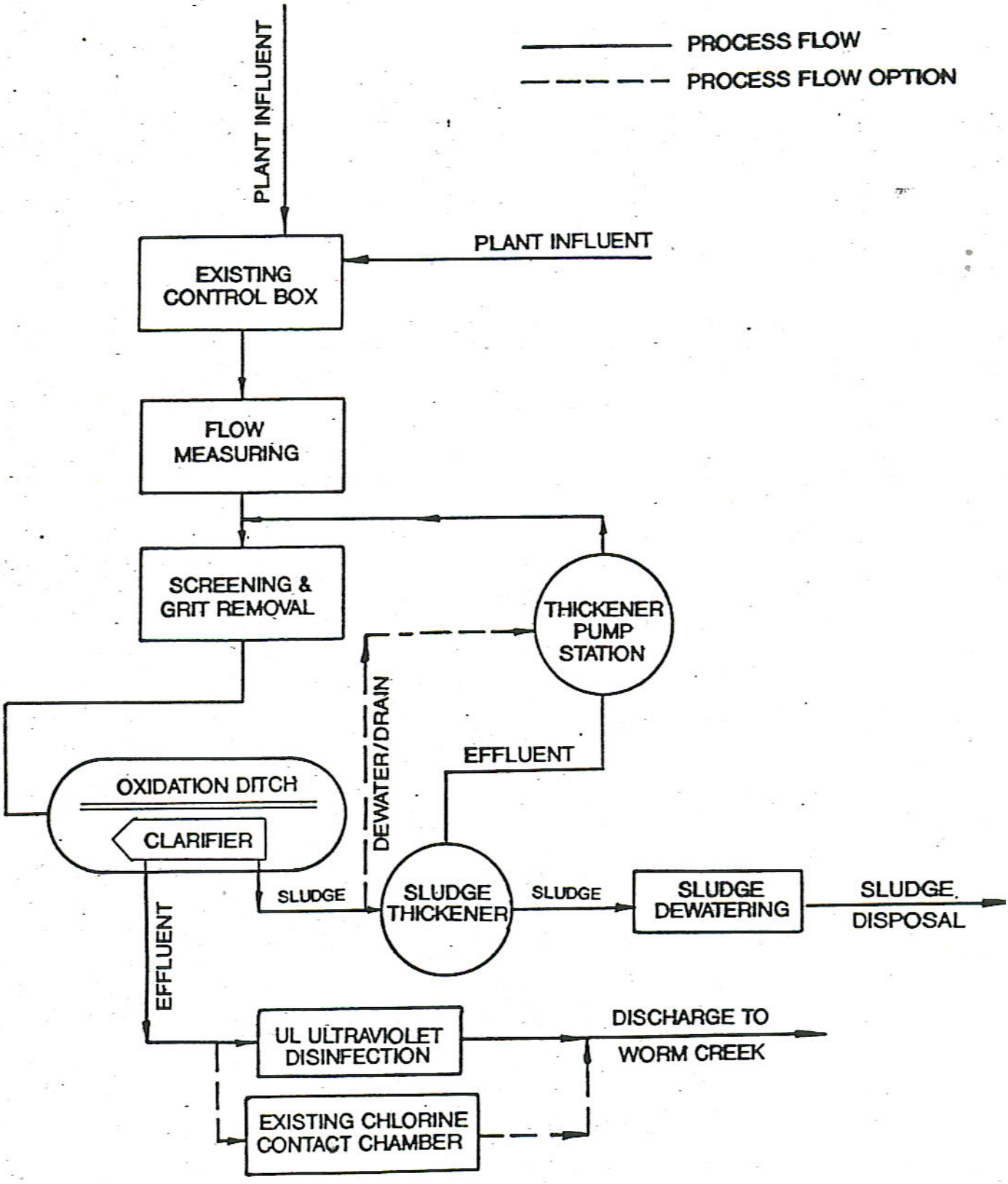
- Mechanical bar screen
- Grit removal

SECONDARY TREATMENT

- Oxidation ditch
- Rotors
- Boat clarifier
- UV disinfection
- Flow measurement

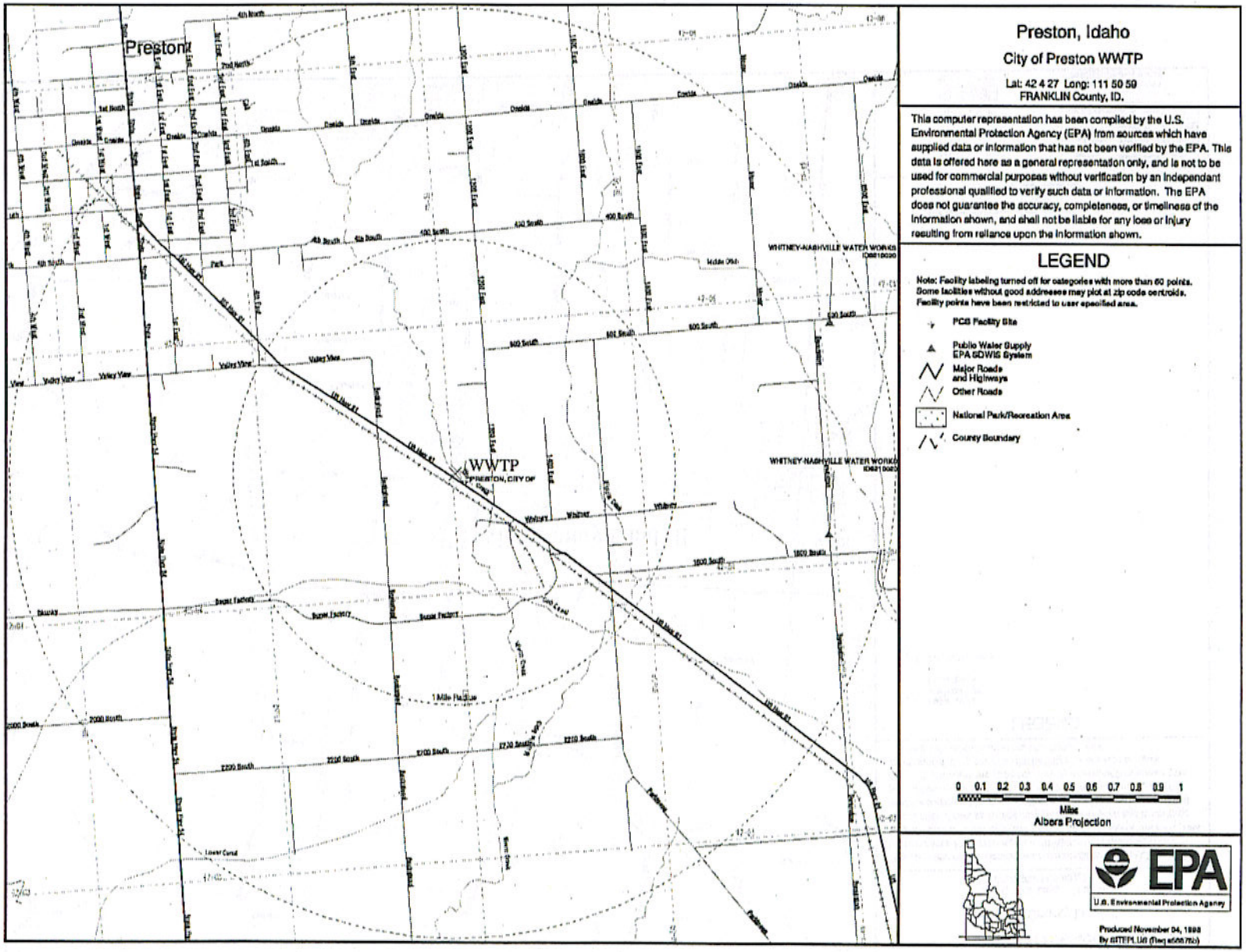
BIOSOLIDS HANDLING

- Gravity thickening
- Dewatering (chemical addition and vertical screw press)


PROCESS FLOW
PROCESS FLOW OPTION
PLANT INFLUENT
PLANT INFLUENT
EXISTING CONTROL BOX
FLOW MEASURING
SCREENING & GRIT REMOVAL
THICKENER PUMP STATION
DEWATER/DRAIN
EFFLUENT
OXIDATION DITCH
CLARIFIER
SLUDGE
SLUDGE THICKENER
SLUDGE
SLUDGE DEWATERING
SLUDGE DISPOSAL
EFFLUENT
UL ULTRAVIOLET DISINFECTION
DISCHARGE TO WORM CREEK
EXISTING CHLORINE CONTACT CHAMBER

APPENDIX B

MAP


Preston, Idaho
City of Preston WWTP
Lat: 42 4 27 Long: 111 50 59
FRANKLIN County, ID.
This computer representation has been compiled by the U.S. Environmental Protection Agency (EPA) from sources which have supplied data or information that has not been verified by the EPA. This data is offered here as a general representation only, and is not to be used for commercial purposes without verification by an independant professional qualified to verify such data or information. The EPA does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any loss or injury resulting from reliance upon the information shown.
LEGEND
Note: Facility labeling turned off for categories with more than 60 points. Some facilities without good addresses may plot at zip code centroids. Facility points have been restricted to user specified area.
PCS Facility Site
Public Water Supply EPA SDWIS System
Major Roads and Highways
Other Roads
National Park/Recreation Area
County Boundary
WWTP
PRESTON, CITY OF
WHITNEY-NASHVILLE WATER WORKS
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
Miles
Albers Projection
EPA
U.S. Environmental Protection Agency
Produced November 04, 1998

B-1

APPENDIX C

CALCULATIONS

WATER QUALITY-BASED EFFLUENT LIMIT CALCULATIONS

This appendix discusses the calculations for the proposed water quality-based effluent limits in the draft permit. This section includes: a discussion of the calculations used to determine reasonable potential to cause or contribute to a violation of water quality standards (Section I); a discussion of the calculations used to develop wasteload allocations (Section II); and a discussion of the calculations used to develop water quality-based effluent limits (Section IV).

I. Reasonable Potential Calculations

To determine if there is "reasonable potential" to cause or contribute to an exceedence of water quality criteria for a given pollutant (and therefore whether a water quality-based effluent limit is needed), for each pollutant present in a discharge, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is "reasonable potential", and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD to conduct this "reasonable potential" analysis. This section discusses how reasonable potential is evaluated.

A. Maximum Projected Receiving Water Concentration

The maximum projected receiving water concentration is determined using the following mass balance equation.

$$C_d \times Q_d = (C_e \times Q_e) + (C_u \times Q_u) \qquad \text{(Equation 1)}$$

where,

C_d = maximum projected receiving water concentration
C_e = maximum projected effluent concentration
C_u = receiving water upstream concentration
Q_e = effluent flow
Q_u = receiving water upstream flow
Q_d = receiving water flow downstream of the effluent discharge $= (Q_e + Q_u)$

If a mixing zone is allowed and solving for C_d, the mass balance equation becomes :

$$C_d = \frac{[C_e Q_e + C_u (Q_u \times MZ)]}{[Q_e + (Q_u \times MZ)]} \qquad \text{(Equation 2)}$$

where, MZ is the percent dilution in the mixing zone based on receiving water flow.

Where no mixing zone is allowed,

$C_d = C_e$. (Equation 3)

B. Maximum Projected Effluent Concentration (C_e)

To better characterize the effects of effluent variability and reduce uncertainty in the process of deciding whether to require an effluent limit, EPA utilizes the statistical approach recommended in the TSD to project the 99th percentile of the effluent data. Since the monitoring data represents a subset of the true effluent concentrations, it is necessary to project the 99th percentile of the effluent data by multiplying the highest concentration in an effluent sample by a multiplier that takes into account effluent variability (i.e., the coefficient of variation or CV) and uncertainty in the effluent data. The 99th percentile concentration of the effluent is calculated using the following equation:

$C_e = MEC \times RPM$ (Equation 4)

where,

MEC = maximum measured effluent concentration
RPM = reasonable potential multiplier.

When there are not enough data to reliably determine a CV (less than 10 data points), the TSD recommends using 0.6 as a default value. Once the CV of the data is determined, the RPM is determined using the statistical methodology discussed in Section 3.3 of the TSD (alternately, Table 3-1 of the TSD may be used). If all the data was below detect, EPA assumes a RPM of 1.0.

$$RPM = \frac{\exp(2.326\sigma - 0.5\sigma^2)}{\exp(z_p\sigma - 0.5\sigma^2)}$$ (Equation 5)

where,

σ^2 = $\ln (CV^2 + 1)$
CV = coefficient of variation
z_p = statistical z-score for p_n
p_n = percentile of highest concentration = $(1 - 0.99)^{1/n}$
n = number of samples

C. Upstream Receiving Water Concentration (C_u)

The upstream receiving water concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from the discharge point. Where sufficient data exists, the 95th percentile of the receiving water data is generally used as an estimate of worst-case. When no data exists, EPA assumes an upstream concentration of zero.

D. Upstream Flow (Q_u)

The upstream flow used in the mass balance equation depends upon the criterion that is being evaluated. In accordance with the applicable federal and state regulations and the TSD guidance, the critical low flows used to evaluate compliance with the water quality criteria are:

- The 1-day, 10-year low flow (1Q10) is used for the protection of aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years.
- The 7-day, 10-year low flow (7Q10) is used for protection of aquatic life from chronic effects. It represents the lowest 7-day average flow expected to occur once in 10 years.
- The 30-day, 5-year low flow (30Q5) is used for the protection of human health and agricultural uses from non-carcinogens. It represents the 30-day average flow expected to occur once in 5 years.
- The harmonic mean flow is a long-term average flow and is used for the protection of human health and agricultural uses from carcinogens. It is the number of daily flow measurements divided by the sum of the reciprocals of the flows.

E. Mixing Zone (MZ)

Mixing zones are defined as a limited area or volume of water where the discharge plume is progressively diluted by the receiving water. Water quality criteria may be exceeded in the mixing zone as long as acutely toxic conditions are prevented from occurring and the applicable existing designated uses of the water body are not impaired as a result of the mixing zone. Mixing zones are allowed at the discretion of the State, based on the State waster quality standards regulations.

The Idaho water quality standards at IDAPA 58.01.02.060 allow for the use of mixing zones after a biological, chemical, and physical appraisal of the receiving water and the discharge. The standards allow water quality within a mixing zone to exceed chronic water quality criteria so long as chronic water quality criteria are met at the boundary of the mixing zone. Acute water quality criteria may be exceeded within a zone of initial dilution inside the chronic mixing zone.

F. Effluent Flow (Q_e)

The effluent flow used in the mass balance equation is the design flow for the facility.

II. Development of Wasteload Allocations (WLAs)

Once EPA has determined that a water quality-based effluent limit is required for a pollutant, the first step in deriving the effluent limit is development of a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that the permittee may discharge without causing or contributing to an exceedence of water quality standards in the receiving water. WLAs and permit limits are derived based on guidance in the TSD (EPA, 1991). WLAs for this permit were established in two ways: based on a mixing zone (for most metals) and based on meeting water quality criteria at "end-of-pipe" (for pH).

WLAs are calculated for each parameter for each criterion. Where the state authorizes a mixing zone for the discharge, the WLA is calculated as a mass balance, based on the available dilution, background concentration of the pollutant, and the water quality criterion.

Since the different criteria (acute aquatic life, chronic aquatic life, human health, agriculture) apply over different time frames and may have different mixing zones, it is not possible to compare the criteria, or the WLAs developed from the criteria, directly to determine which criterion results in the most stringent limits. For comparison between aquatic life criteria, human health criteria, and agricultural criteria, effluent limits must be derived for each, and the most stringent effluent limits apply to the discharge.

WLAs are calculated using the same mass balance equation used in the reasonable potential evaluation (see Equation 1) although, C_d becomes the criterion and C_e the WLA. Making these substitutions, Equation 1 is rearranged to solve for the WLA (or C_e), becoming:

$$WLA = C_e = \frac{[\text{criterion} \times (Q_e + (Q_u \times MZ)] - [C_u (Q_u \times MZ)]}{Q_e} \qquad \text{(Equation 6)}$$

Where no mixing zone is allowed, the criterion becomes the WLA (see Equation 6). Establishing the criterion as the WLA ensures that the permittee does not contribute to an exceedence of the criteria.

$$WLA = \text{criterion.} \qquad \text{(Equation 7)}$$

III. Derivation of Water Quality-based Effluent Limits

Because many criteria for protection of aquatic life have two criteria, acute and chronic, the effluent limits for each requirement yields different effluent treatment requirements

that cannot be compared to each other without calculating the long-term average performance level the facility would need to maintain in order to meet each requirement. Therefore, EPA develops effluent limits for aquatic life protection by statistically converting the WLAs to long-term average (LTA) concentrations and using the most stringent LTA to develop effluent limitations for protection of aquatic life. This procedure will allow the facility to design a treatment system for one level of effluent toxicity - the most limiting toxic effect.

A. Long-term Average Concentrations (LTAs) for Aquatic Life Criteria

The conversion of a WLA to a LTA is dependent upon the coefficient of variation (CV) of existing effluent data and the selected probability distribution of the effluent. The probability distribution corresponds to the percentile of the estimated effluent concentration. EPA uses a 99th percentile probability distribution for calculating a long-term average, as recommended in the TSD (EPA, 1991). The following equation from Chapter 5 of the TSD is used to calculate the LTA concentrations (alternately, Table 5-1 of the TSD may be used):

$$LTA = WLA \times \exp[0.5\sigma^2 - z\sigma] \qquad \text{(Equation 8)}$$

where,

σ^2 = $\ln(CV^2 + 1)$ for acute aquatic life criteria
= $\ln(CV^2/4 + 1)$ for chronic aquatic life criteria
CV = coefficient of variation
z = 2.326 for 99th percentile occurrence probability.

B. Effluent Limits Based on Aquatic Life Criteria

Once the LTA concentration is calculated for each criterion, the most stringent LTA concentration is then used to develop the maximum daily (MDL) and monthly average (AML) permit limits. The MDL is based on the effluent variability (i.e., CV of the data) and the selected probability distribution, while the AML is dependent upon these two variables as well as the monitoring frequency. As recommended in the TSD, EPA used the 95th percentile as the selected probability distribution for the AML calculation and the 99th percentile for the MDL calculation. The MDL and AML are calculated using the following equation from the TSD (alternately, Table 5-2 of the TSD may be used):

$$MDL \text{ or } AML = LTA\ \sigma \exp[z\sigma - 0.5\sigma^2] \qquad \text{(Equation 9)}$$

for the MDL:

σ^2 = $\ln(CV^2 + 1)$
z = 2.326 for the 99th percentile occurrence probability

for the AML:

σ^2 = $\ln(CV^2/n + 1)$
n = number of sampling events required per month

z = 1.645 for the 95th percentile occurrence probability.

C. Effluent Limits Based on Human Health and Agricultural Criteria

Developing permit limits for pollutants affecting human health agriculture is somewhat different from setting limits for aquatic life because the exposure period is generally longer than one month and the average exposure, rather than the maximum exposure, is usually of concern. Because compliance with permit limits is normally determined on a daily or monthly basis, it is necessary to set human health and agriculture permit limits that meet a given WLA for every month.

If the procedures described previously for aquatic life protection were used for developing permit limits for human health and agriculture, both MDLs and AMLs would exceed the WLA necessary to meet criteria concentrations in the receiving water. Thus, even if a facility was discharging in compliance with permit limits calculated using these procedures; it would be possible to constantly exceed the WLA.

In addition, the statistical derivation procedure is not applicable to exposure periods more than 30 days. Therefore, the recommended statistical approach for setting water quality-based limits for human health and agriculture protection is to set the AML equal to the WLA, and then calculate the MDL based on effluent variability and the number of samples per month using the multipliers provided in Table 5-3 of the TSD. These multipliers are the ratio of the MDL to the AML as calculated by the following relationship:

$$\frac{MDL}{AML} = \frac{\exp[z_m\sigma - 0.5\sigma^2]}{\exp[z_a\sigma_n - 0.5\sigma_n^2]} \qquad \text{(Equation 10)}$$

where,

σ_n^2 = $\ln (CV^2/n + 1)$
σ^2 = $\ln (CV^2 + 1)$
CV = see Table D-7
n = number of samples per month
z_m = 2.326 for the 99th percentile exceedance probability of the MDL
z_a = 1.645 for the 95th percentile exceedance probability of the AML.

As stated above, EPA used the 95th percentile as the selected probability distribution for the AML and the 99th percentile for the MDL in this calculation

AMMONIA

Waste load allocations (WLA): Criteria applied at the end of pipe

WLA_{acute} = 7.62	mg/L
$WLA_{chronic}$ = 2.5	mg/L

Calculate long term averages (LTA)

$LTA_a = WLA_a*\exp(0.5\sigma^2-z\sigma)$	(*Technical Support Document for Water Quality Based Toxics Control* EPA, 1991, Table 5-1 Acute)
CV = 0.6	ratio of standard deviation to mean
σ^2(acute) = 0.31	
z = 2.326	(99th percentile)
LTA_{acute} = **2.45**	

$LTA_a = WLA_c*\exp(0.5\sigma_4^2-z\sigma_4)$	(*Technical Support Document for Water Quality Based Toxics Control* EPA, 1991, Table 5-1 Chronic)
$CV_{chronic}$ = 0.6	ratio of standard deviation to mean
σ_n^2 = 0.09	
z = 2.326	(99th percentile)
$LTA_{chronic}$ = **1.32**	

Lowest LTA = LTA_c = 1.32

Calculate Maximum Daily Limit (MDL) concentration and loading

$MDL = LTA*\exp(z\sigma-0.5\sigma^2)$	(*Technical Support Document for Water Quality Based Toxics Control* EPA, 1991, Table 5-2 Maximum Daily Limit)
MDL load = (MDL)(design flow)(8.34)	Design flow = 1.2 mgd
MDL = 4.1	mg/L
MDL load = 41.1	lb/day

Calculate Average Monthly Limit AML concentration and loading

$AML = LTA*\exp(z\sigma_n-0.5\sigma_n^2)$	(*Technical Support Document for Water Quality Based Toxics Control* EPA, 1991, Table 5-2 Average Monthly Limit)
MDL load = (AML)(design flow)(8.34)	Design flow = 1.2 mgd
n = 4	(# of samples per month)
z = 1.645	(95th percentile)
AML = 2.0	mg/l
AML load = 20.5	lb/day